What is claimed is:

1. A method of accounting for crystal cut error in an ion implantation system comprising:

obtaining data relating to an orientation of a mechanical surface of a wafer relative to an ion beam directed at the surface of the wafer to implant ions within select locations of the wafer;

obtaining data regarding features formed upon the surface of the wafer, including respective spacings exiting between the features;

determining respective degrees of shading likely to result during ion implantation given the orientation data and the feature data;

determining what adjustments, if any, should be made to the relative orientation between the ion beam and the wafer surface to adequately mitigate potential shadowing;

obtaining cut error data relating to the orientation of the mechanical surface of the wafer relative to an actual lattice structure of the wafer;

determining the severity of channeling likely to result from the ion implantation given the orientation data and the cut data

determining what adjustments, if any, should be made to the relative orientation between the ion beam and wafer surface to achieve desired channeling;

determining whether the proposed adjustments to mitigate shadowing and the proposed channeling adjustments are coincident;

determining an acceptable relative re-orientation between the ion beam and wafer surface if the proposed adjustments are not coincident; and

adjusting the relative orientation between the ion beam and wafer surface as needed.

2. The method of claim 1, wherein the crystal cut error data is obtained from at least one of a wafer supplier, a stand alone tool and the same or a different implantation system.

3. The method of claim 2, wherein the crystal cut error data is obtained utilizing at least one of Rutherford backscattering, x-ray diffraction and crystallography.

4. The method of claim 1, wherein determining what adjustments, if any, should be made to adequately mitigate potential shadowing considers at least one of predefined shadowing tolerances that are based upon the types of semiconductor devices being fabricated and performance specifications and acceptable failure rates for those devices.

5. The method of claim 1, wherein determining what adjustments, if any, should be made to adequately mitigate potential channeling considers at least one of predefined channeling tolerances that are based upon the types of semiconductor devices being fabricated and performance specifications and acceptable failure rates for those devices.

6. The method of claim 1, wherein determining an acceptable re-orientation to adequately mitigate channeling and shadowing further comprises:

considering respective effects that different degrees of channeling and shadowing can have on predefined performance criteria;

comparing these effects to predefined acceptable levels; and

assigning a weight to the different degrees of channeling and shadowing based upon the severity of the respective effects and the acceptable levels.

7. The method of claim 1, wherein the feature data includes a width of one or more of the features.

8. A method of accounting for crystal cut error in one or more ion implantation systems, comprising:

periodically feeding forward crystal cut error data associated with a wafer to one or more stages of one or more ion implantation systems through which the wafer is matriculating, where the crystal cut error data pertains to a variation between a nominal crystalline lattice structure and an actual crystalline lattice structure and a mechanical surface of the wafer; and

determining how to adjust a relative orientation between an ion beam and the surface of the wafer to achieve desired ion implantation in light of the crystal cut error data.

9. The method of claim 8, wherein the crystal cut error data is fed forward to the one or more stages or systems when the wafer or a portion thereof is about to be implanted with ions from the ion beam.

10. The method of claim 9, wherein respective crystal cut error data associated with particular wafers is fed forward a single time to the one or more stages or systems upon a first passage of the respective wafers through the stages or systems, the one or more stages or systems retaining the respective crystal cut error data associated with particular wafers should the wafers matriculate through those stage or systems multiple times, the one or more stages or systems re-using corresponding wafer data upon re-treating particular wafers as the respective wafers re-matriculate through the one or more stages or systems.

11. The method of claim 10, wherein a single instance of crystal cut error data is associated with a plurality of wafers and is fed forward a single time to the one or more stages or systems that may treat one or more of the plurality of wafers one or more times, the one or more stages or systems retaining the single instance of the crystal cut error data associated with the plurality of wafers, the one or more stages or systems using and re-using the crystal cut error data upon treating and re-treating, respectively, one or more of the plurality of wafers as one or more of the plurality of wafers matriculates and re-matriculates, respectively, through the one or more stages or systems.

12. The method of claim 11, wherein a single instance of crystal cut error data is associated with a plurality of wafers that are cut at the same orientation from a single boule.

13. The method of claim 12, wherein respective instances of crystal cut error data are associated with batches of wafers cut from different boules.

14. The method of claim 13, wherein respective instances of crystal cut error data are associated with different batches of wafers that are cut in series from the same boule.

15. A method of implanting ions within a wafer with an ion beam, comprising:

obtaining crystal cut error data regarding a variation between a nominal crystalline lattice structure and an actual crystalline lattice structure and a mechanical surface of the wafer;

obtaining data regarding features formed upon the surface of the wafer, including respective spacings exiting between the features; and

adjusting a relative orientation between the ion beam and surface of the wafer to adequately mitigate shadowing effects and achieve desired channeling in light of the crystal cut error data and the feature data.

16. The method of claim 15, wherein a single instance of crystal cut error data is associated with a plurality of wafers that are cut at the same orientation from a single boule.

17. The method of claim 16, wherein respective instances of crystal cut error data are associated with batches of wafers cut from different boules.

18. The method of claim 17, wherein respective instances of crystal cut error data are associated with different batches of wafers that are cut in series from the same boule.

19. A method of implanting ions into a workpiece comprising:

obtaining implantation data relevant to determining a relative orientation between an ion beam containing the ions to be implanted and a surface of the workpiece into which the ions are to be implanted;

determining what adjustments, if any, should be made to the relative orientation between the ion beam and the surface of the workpiece based upon the implantation data; and

selectively adjusting the relative orientation between the ion beam and the workpiece surface based upon the adjustment determination.

20. The method of claim 19, wherein the implantation data includes data relating to the orientation of the mechanical surface of the workpiece relative to the ion beam directed at the surface of the workpiece to implant ions within select locations of the workpiece.

21. The method of claim 20, wherein the implantation data includes data regarding one or more features formed upon the surface of the workpiece, including respective spacings existing between the features, and

wherein the adjustment determination considers respective degrees of shadowing likely to result during ion implantation given the orientation data and the feature data, the determination attempting to mitigate shadowing.

22. The method of claim 20, wherein the implantation data includes cut error data relating to a relative orientation between the surface of the workpiece and a lattice structure of the workpiece, and

wherein the adjustment determination considers a severity of channeling likely to result from the ion implantation given the orientation data and the cut data, the determination attempting to mitigate channeling.

23. The method of claim 21, wherein the implantation data further includes data relating to a relative orientation between the surface of the workpiece and a lattice structure of the workpiece, and

wherein the adjustment determination also considers a severity of channeling likely to result from the ion implantation given the orientation data and the cut data, the determination also attempting to mitigate channeling.

24. The method of claim 21, wherein the feature data includes a width of one or more of the features

25. An ion implantation system comprising:

an ion source for generating ions;

a beamline assembly for generating an ion beam from the ions generated by the ion source and directing the ions along a path of travel;

an endstation for positioning a workpiece relative to the path of travel so that ions traveling in the ion beam impact the workpiece at select locations; and

a processor that assists with obtaining implantation data relevant to determining a relative orientation between the ion beam and the surface of the workpiece to be impacted thereby.

26. The system of claim 25, wherein the implantation data includes data relating to the orientation of the mechanical surface of the workpiece relative to the ion beam directed at the surface of the workpiece to implant ions within select locations of the workpiece.

27. The system of claim 26, wherein the implantation data includes data regarding one or more features formed upon the surface of the workpiece, including respective spacings existing between the features, the processor determining respective degrees of shading likely to result during ion implantation given the orientation data and the feature data, and what adjustments, if any, should be made to the relative orientation between the ion beam and the surface of the workpiece to adequately mitigate shading.

28. The system of claim 26, wherein the implantation data includes cut error data relating to a relative orientation between the surface of the workpiece and a lattice structure of the workpiece, the processor determining the severity of channeling likely to result from the ion implantation given the orientation data and the cut data, and what adjustments, if any, should be made to the relative orientation between the ion bean and the surface of the workpiece to adequately mitigate channeling.

29. The system of claim 27, wherein the implantation data further includes cut error data relating to a relative orientation between the surface of the workpiece and a lattice structure of the workpiece, the processor also determining the severity of channeling likely to result from the ion implantation given the orientation data and the cut data, and what adjustments, if any, should be made to the relative orientation between the ion bean and the surface of the workpiece to adequately mitigate channeling.

30. The system of claim 29, wherein, to determine what adjustments, if any, should be made to the relative orientation between the ion bean and the surface of the workpiece to adequately mitigate shading and channeling, the processor also

considers respective effects that different degrees of channeling and shadowing can have on predefined performance criteria;

compares these effects to predefined acceptable levels; and

assigns a weight to the different degrees of channeling and shadowing based upon the severity of the respective effects and the acceptable levels.

31. The system of claim 27, wherein the feature data includes a width of one or more of the features.

32. The system of claim 28, wherein the cut error data is obtained utilizing at least one of Rutherford backscattering, x-ray diffraction and crystallography.